

Non-CO₂ Greenhouse Gases: High-GWP Gases

Source/Sectors: Substitution of ODS/Solvent Uses

Technology: Semi-aqueous cleaning (C.1.3.3)

Description of the Technology:

The semi-aqueous cleaning process uses a solution consisting of hydrocarbon and surfactant to remove contaminants. An example of a solvent/surfactant blend is a terpene/water combination blended with glycol ethers (UNEP, 1999). The products are then rinsed with water.

Effectiveness: This technology can successfully displace HFCs and PFCs usage in some solvent applications.

Implementability: Good

Reliability: They have good cleaning ability, suppressed vapor pressure, and reduced evaporative loss. Some technical limitations, such as substrate corrosion, inadequate performance for applications with complex parts, still remain (USEPA, 2006b).

Maturity: Semi-aqueous cleaning technologies have been available for years (UNEP, 1999). Further market penetration is not expected in the United States, where the market prefers fluorinated solvents such as HFCs and HFEs (USEPA, 2006b).

Environmental Benefits: High-GWP gases emission reduction

Cost Effectiveness:

Technology	Lifetime (yrs)	MP (%)	RE (%)	TA (%)	Capital cost	Annual cost	Benefits
Semi-aqueous cleaning ¹	10	3	100	90 - 100	\$22.22	\$0.00	\$0.00

Note: MP: market penetration; RE: reduction efficiency; TA: technical applicability; costs are in year 2000 US\$/MT_{CO₂-Eq.}

1: USEPA (2001), IEA (2003), & USEPA (2004)

Industry Acceptance Level: Many electronics and metal cleaning sectors worldwide have already adopted this technology (IEA, 2003).

Limitations: Flammability and VOC emissions are of concerns but can be solved by improving the equipment design (IEA, 2003).

Sources of Information:

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